

TROP, PRUNER & HU, P.C.

INTELLECTUAL PROPERTY LAW ATTORNEYS

1616 S. Voss Rd., Suite 750
Houston, Texas 77057-3621
Bus: (713) 468-8880
Fax: (713) 468-8883

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Serial No.:	10/694,564	Our Re:	11284 (NCR0117US)

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Attorney Docket No.: 11284 (NCR0117US)
Date: March 12, 2007

DCH/gky

Applicant(s): GANG LUO ET AL.
Serial No.: 10/694,564
Filing Date: October 27, 2003
Title: GROUPING DATABASE QUERIES AND/OR TRANSACTIONS

1. Transmittal of Appeal Brief (in duplicate)
2. Appeal Brief.

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TRANSMITTAL OF APPEAL BRIEF (Large Entity)					Docket No. NCR.0117US	
In Re Application Of: Gang Luo et al.						
Application No. 10/694,564	Filing Date 10-27-2003	Examiner Brent S. Stace	Customer No. 26890	Group Art Unit 2161	Confirmation No. 2425	
Invention: Grouping Database Queries and/or Transactions					RECEIVED CENTRAL FAX CENTER MAR 12 2007	

COMMISSIONER FOR PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:
January 11, 2007

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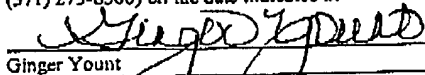
Dated: **March 12, 2007**

Dan C. Hu
Registration No. 40,025
TROP, PRUNER & HU, P.C.
1616 South Voss Road, Suite 750
Houston, TX 77057-2631
Telephone: (713) 468-8880, ext. 304
Facsimile: (713) 468-8883

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Applicants:	Gang Luo et al.	§	Art Unit:	2161
Serial No.:	10/694,564	§		
Filed:	October 27, 2003	§	Examiner:	Brent S. Stace
For:	Grouping Database Queries and/or Transactions	§	Atty. Dkt. No.:	11284 (NCR.0117US)

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Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

Sir:

The final rejection of claims 1-12, 14-20, 22-26, and 28-30 is hereby appealed.

I. REAL PARTY IN INTEREST

The real party in interest is NCR Corporation.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF THE CLAIMS

Claims 1-12, 14-20, 22-26, and 28-30 have been finally rejected and are the subject of this appeal. Claims 13, 21, and 27 have been cancelled.

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<u>Ginger Yount</u>
Ginger Yount

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

IV. STATUS OF AMENDMENTS

No amendment after final has been submitted.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Independent claim 1 recites a method comprising:

establishing multiple sessions with a database system (Fig. 1: 10), each session associated with at least one transaction (Spec, ¶¶ [016, 033]);

identifying transactions that operate on the same set of one or more tuples (Spec, ¶ [036]);

re-allocating transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples are allocated to one of the sessions (Spec, ¶ [036]);

identifying statements in a particular one of the transactions that specify modification operations that are commutative and associative (Spec, ¶¶ [019, 025, 040]);

combining the identified statements into one statement (Spec, ¶¶ [025, 041]); and

submitting the one statement to the database system (Spec, ¶ [030]).

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

Independent claim 14 recites an article comprising at least one storage medium containing instructions that when executed cause a controller to:

identify statements in a first transaction that specify modification operations on values b_1 through b_m , m greater than 1, that are commutative and associative, each of the modification operations applied on a set of one or more tuples (Spec, ¶¶ [019, 025, 040]);

combine the identified statements into one statement that specifies a modification operation on a value c that is an aggregation of b_1 through b_m , the aggregation being one of addition and multiplication (Spec, ¶¶ [025, 041]); and

submit the one statement to a database system (Spec, ¶ [030]).

Independent claim 22 recites a system comprising:

an interface (Fig. 1:28) to receive first queries from a client system (Spec, ¶ [012]);

one or more processors (Fig. 1:28; Spec, ¶ [043]); and

a software utility (Fig. 1:20) executable on the one or more processors to:
establish plural sessions with a database system, each session associated with at least one transaction (Spec, ¶¶ [016, 033]);

identify transactions that operate on the same set of one or more tuples (Spec, ¶ [036]);

re-allocate transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples is allocated to one of the sessions (Spec, ¶ [036]);

identify first queries of a particular one of the transactions that specify commutative and associative operations (Spec, ¶¶ [019, 025, 040]), and

group the identified first queries into a second query (Spec, ¶¶ [025, 041]).

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- A. Claims 1-4, 10-12, 14-17, 22-26, And 28-30 Rejected Under 35 U.S.C. § 103 Over U.S. Patent No. 6,829,600 (Gu) In View Of B. Walter, "Nested Transactions With Multiple Commit Points: An Approach To The Structuring Of Advanced Database Application," (Walter), And "Introduction To Algebra," (MathLeague).**
- B. Claims 8, 9, and 20 Rejected Under 35 U.S.C. § 103 Over Gu in View of Walter, MathLeague, and "Lesson on Order of Operations With Exponents," (MathGoodies).**
- C. Claims 5-7, 18, And 19 Rejected Under 35 U.S.C. § 103 Over Gu In View Of Walter, MathLeague, And U.S. Patent No. 6,714,938 (Avadhanam).**

VII. ARGUMENT

The claims do not stand or fall together. Instead, Appellant presents separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-headings as required by 37 C.F.R. § 41.37(c)(1)(vii).

- A. Claims 1-4, 10-12, 14-17, 22-26, And 28-30 Rejected Under 35 U.S.C. § 103 Over U.S. Patent No. 6,829,600 (Gu) In View Of B. Walter, "Nested Transactions With Multiple Commit Points: An Approach To The Structuring Of Advanced Database Application," (Walter), And "Introduction To Algebra," (MathLeague).**

1. Claims 1-4, 22-26

Claim 1 was rejected as being obvious over Gu, Walter, and MathLeague. It is respectfully submitted that a *prima facie* case of obviousness has not been established with respect to claim 1 for at least the following reasons: (1) no motivation or suggestion existed to combine the teachings of the references; and (2) the hypothetical combination of the references does not teach or suggest *all* elements of claim 1. See M.P.E.P. § 2143 (8th ed., Rev. 5), at 2100-126.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

“The PTO has the burden under section 103 to establish a *prima facie* case of obviousness.” *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). The PTO “can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.” *Id.* It is respectfully submitted that the Examiner has failed to cite sufficient evidence to establish a *prima facie* case of obviousness.

The Examiner conceded that Gu fails to disclose establishing multiple sessions with the database system where each session is associated with at least one transaction; identifying transactions that operate on the same set of one or more tuples; and re-allocating transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples is allocated to one of the sessions. 10/12/2006 Office Action at 7-8. The Examiner relied upon Walter as disclosing the establishment of multiple sessions with a database system. *Id.*, at 8 (citing to page 168, ¶ C, of Walter). For the acts of identifying transactions that operate on the same set of one or more tuples and re-allocating transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples are allocated to one of the sessions, the Examiner relied upon MathLeague. *Id.*

With respect to MathLeague, the Examiner focused specifically on the algebraic technique of simplifying equations by multiplying both sides of an equation by the same value. Multiplying both sides of the equation by the same value to simplify or otherwise modify an equation has nothing to do with the subject matter recited in claim 1, namely identifying *transactions* that operate on the same set of one or more tuples, and re-allocating *transactions* between or among *sessions* with a database system such that the identified *transactions* that operate on the *same set of one or more tuples* is allocated to one of the *sessions*. The

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

MathLeague reference is a reference entitled "Introduction to Algebra." This reference is a relatively basic reference that introduces basic algebraic concepts. The concepts relating to algebra described in MathLeague have nothing to do with sessions established with a database system and identifying and re-allocating transactions among such sessions with the database system.

In response to Appellant's arguments, the Examiner contends that "it appears that applicant does not understand how the references were and are combined." 10/12/2006 Office Action at 3. Then the Examiner proceeded to identify isolated teachings of the references and to combine the isolated teachings in a piecemeal fashion using impermissible hindsight that benefits from the teachings of the present invention. *See id.* The Examiner stated that MathLeague, pg. 7, is combined with Walter, pg. 168, paragraph C, with Gu, col. 1, lines 25-37 and 49-67 to reject the claims.

The Examiner first argued that "the transactions of Walter are the sessions in the claim." 10/12/2006 Office Action at 3. The Examiner then argued that the "multiplication of 12 on the left hand side of the equation [on page 7 of MathLeague] is one transaction while the multiplication of 12 on the right hand side is a second transaction." *Id.* The Examiner then argued that "[t]hese transactions are grouped together in Walter as being in the same commit scope so both sides would be modified on commit (to maintain the equivalence in the equation), thus solving/simplifying transactions like the cited transaction of Gu." *Id.*

The problem with the Examiner's analysis is that the combined references still does not teach or suggest *re*-allocating transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples are allocated to one of the sessions. The Examiner identified the *transactions* of Walter as being the *sessions* of claim 1.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

Then the Examiner identified the two sides of the equation on page 7 of MathLeague as being two transactions. There is no suggestion by any of the cited references, whether explicit or implicit, of *re*-allocating the two sides of the equation on page 7 of MathLeague between or among the transactions of Walter. The Examiner is construing the two sides of equation on page 7 of MathLeague as two separate transactions, and then arguing, without any support in the references, that these two transactions would be *re*-allocated between or among the transactions of Walter.

The Examiner further argued that “re-allocating transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples are allocated to one of the sessions” “is seen as combining the sequence of transactions into a single atomic statement (like I [sic] Gu, col. 1, lines 25-37).” 10/12/2006 Office Action at 3. The cited passages in Gu refer to combining a sequence of INSERT and UPDATE commands into a single atomic statement. Combining the commands of Gu refer to combining SQL statements—there is no suggestion of *re*-allocating transactions between or among sessions.

It is clear that even if Gu, Walter, and MathLeague can be combined, the hypothetical combination of the teachings of all three references fails to teach or suggest the combination of the identifying and re-allocating steps of claim 1. This is a first reason that a *prima facie* case of obviousness has not been established with respect to claim 1.

Moreover, there simply did not exist any motivation or suggestion to combine the teachings of Gu, Walter, and MathLeague. Gu describes an SQL MERGE statement in which conditional INSERT and UPDATE commands are combined such that the UPDATE command is executed if a condition is satisfied, but the INSERT command is executed if the condition is not satisfied. *See* Gu, 1:28-67. Walter, on the other hand, describes on page 168 “commit spheres”

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

that control how transactions can commit. MathLeague describes various algebraic techniques, including the technique of simplifying equations, which have nothing to do with either the MERGE statement of Gu or the commit spheres for transactions described in Walter. Also, there exists no suggestion of any desirability to incorporate the commit techniques described in Walter into the Gu system that uses a MERGE statement.

Thus, the Examiner appears to have performed an arbitrary selection of completely unrelated elements from disparate prior art references in an attempt to piece together such unrelated elements to achieve the claimed subject matter. The Examiner argued that “[i]t would have been obvious to one of ordinary skill in the art at the time of invention to combine Walter and MathLeague with Gu because the inventions are directed towards modifying data within a period of time or a certain time.” 10/12/2006 Office Action at 8. The MathLeague reference describes basic algebraic concepts—it is not directed towards modifying data within a period of time or a certain time. Thus, the statement inaccurately characterizes at least the MathLeague reference.

The Examiner’s obviousness rejection is based on impermissible hindsight, which is strictly prohibited. *See In re Fine*, 837 F.2d at 1075. Therefore, it is respectfully submitted that a *prima facie* case of obviousness has not been established with respect to claim 1 for the additional reason that no motivation or suggestion existed to combine the teachings of Gu, Walter, and MathLeague. Therefore, claim 1, and its dependent claims, are allowable over Gu, Walter, and MathLeague.

Independent claim 22, and its dependent claims, are allowable over the cited references for similar reasons as claim 1.

Reversal of the final rejection of the above claims is respectfully requested.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

2. Claims 10-12, 28-30

Claims 10-12 depend from claim 1, and claims 28-30 depend from claim 22; therefore, claims 10-12 and 28-30 are allowable for at least the same reasons as the corresponding independent claims.

Moreover, claim 10 recites that identifying the statements comprises identifying statements $\langle t, b_1 \rangle$ through $\langle t, b_m \rangle$, m being greater than 1, where t represents a set of one or more tuples, and b_1 through b_m represent respective modification operations on the set of one or more tuples. Claim 10 further recites that combining the identified statements comprises combining the identified statements into statement $\langle t, c \rangle$, where c represents an aggregation of b_1 through b_m .

The Examiner cited page 7 of MathLeague and Gu, col. 1, lines 55-67, as disclosing the subject matter of claim 10. This assertion is clearly incorrect. Although Gu refers to combining an UPDATE statement and an INSERT statement into a single atomic statement, the combination is not in the manner recited in claim 10. Note that according to claim 10, there is initially at least statements $\langle t, b_1 \rangle$ and $\langle t, b_2 \rangle$. The combination of these two statements results in $\langle t, c \rangle$, where $c = b_1 + b_2$. The combination of the UPDATE and INSERT statement of Gu results in a MERGE statement that still contains the UPDATE and INSERT statements, except a condition is specified in the MERGE statement for performing UPDATE if the data already exists in a destination, and to perform INSERT if the data does not exist in the destination. Gu, 1:36-43. Providing the UPDATE and INSERT statements as conditional statements combined into the MERGE statement, as taught by Gu, clearly provides absolutely no suggestion of combining statements $\langle t, b_1 \rangle$ and $\langle t, b_2 \rangle$ into $\langle t, c \rangle$, where $c = b_1 + b_2$.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

The MathLeague reference specifies an equation in which the number 12 is multiplied to both sides—there is absolutely no suggestion here of combining statements $\langle t, b_1 \rangle$ through $\langle t, b_m \rangle$, m being greater than 1, in the manner recited in claim 10.

Therefore, the obviousness rejection of claims 10-12, and also of claims 28-30, is further defective for this additional reason.

Reversal of the final rejection of the above claims is respectfully requested.

3. Claims 14-17

Independent claim 14 was also rejected as being obvious over Gu, Walter, and MathLeague. The Examiner stated that claim 14 was rejected for the same reasons as stated for claim 11 or 12 (both depending from claim 10, discussed above).

It is respectfully submitted that a *prima facie* case of obviousness has clearly not been established with respect to claim 14, for at least the reason that the hypothetical combination of Gu, Walter, and MathLeague fails to teach or suggest identifying statements in a first transaction that specify modification operations on values b_1 through b_m , m greater than 1, that are commutative and associative, where each of the modification operations is applied on a set of one or more tuples, and combining the identified statements into one statement that specifies a modification operation on a value c that is an aggregation of b_1 through b_m , the aggregation being one of addition and multiplication.

The combining of conditional INSERT and UPDATE statements into a MERGE statement as taught by Gu is completely different from the combining specified in claim 14, as discussed above with respect to claim 10. Moreover, neither MathLeague nor Walter teaches or suggests the subject matter of claim 14.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

Therefore, since the hypothetical combination of Gu, Walter, and MathLeague fails to teach or suggest all elements of claim 14, a *prima facie* case of obviousness has not been established. Also, the *prima facie* case of obviousness is defective for the additional reason that no motivation or suggestion existed to combine the references, as discussed above with respect to claim 1.

Reversal of the final rejection of the above claims is therefore respectfully requested.

B. Claims 8, 9, And 20 Rejected Under 35 U.S.C. § 103 Over Gu In View Of Walter, MathLeague, And "Lesson On Order Of Operations With Exponents," (MathGoodies).

1. Claims 8, 9, 20

In view of the defective obviousness rejection of base claims 1 and 14 over Gu, Walter, and MathLeague, it is respectfully submitted that the obviousness rejection of dependent claims 8, 9, and 20 over Gu, Walter, MathLeague, and MathGoodies is also defective.

Reversal of the final rejection of the above claims is respectfully requested.

C. Claims 5-7, 18, And 19 Rejected Under 35 U.S.C. § 103 Over Gu In View Of Walter, MathLeague, And U.S. Patent No. 6,714,938 (Avadhanam).

1. Claims 5-7, 18, 19

In view of the defective obviousness rejection of base claims 1 and 14 over Gu, Walter, and MathLeague, it is respectfully submitted that the obviousness rejection of dependent claims 5-7, 18, and 19 over Gu, Walter, MathLeague, and Avadhanam is also defective.

Reversal of the final rejection of the above claims is respectfully requested.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

VIII. CONCLUSION

In view of the foregoing, reversal of all final rejections and allowance of all pending claims is respectfully requested.

Respectfully submitted,

Date: 3-12-2007



Dan C. Hu
Registration No. 40,025
TROP, PRUNER & HU, P.C.
1616 South Voss Road, Suite 750
Houston, TX 77057-2631
Telephone: (713) 468-8880
Facsimile: (713) 468-8883

Appl. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

APPENDIX OF APPEALED CLAIMS

The claims on appeal are:

- 1 1. A method comprising:
2 establishing multiple sessions with a database system, each session associated
3 with at least one transaction;
4 identifying transactions that operate on the same set of one or more tuples;
5 re-allocating transactions between or among the sessions such that the identified
6 transactions that operate on the same set of one or more tuples are allocated to one of the
7 sessions;
8 identifying statements in a particular one of the transactions that specify
9 modification operations that are commutative and associative;
10 combining the identified statements into one statement; and
11 submitting the one statement to the database system.
- 1 2. The method of claim 1, wherein identifying the statements comprises identifying
2 Structured Query Language (SQL) statements.
- 1 3. The method of claim 1, wherein combining the identified statements is performed
2 prior to submitting the one statement to the database system.
- 1 4. The method of claim 1, further comprising grouping plural ones of the
2 transactions into the particular transaction.
- 1 5. The method of claim 4, wherein establishing the multiple sessions, identify the
2 transactions, re-allocating the transactions, identifying the statements, combining the identified
3 statements, submitting the one statement, and grouping the plural transactions are performed by a
4 module separate from a database engine of the database system.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

1 6. The method of claim 1, wherein establishing the multiple sessions, identifying the
2 transactions, re-allocating the transactions, identifying the statements, combining the identified
3 statements, and submitting the one statement are performed by a module separate from a
4 database engine of the database system.

1 7. The method of claim 6, wherein identifying the statements, combining the
2 identified statements, and submitting the one statement are performed by the module without
3 first accessing data in relational tables.

1 8. The method of claim 1, further comprising switching an order of statements in the
2 particular transaction to place the identified statements adjacent to each other.

1 9. The method of claim 8, further comprising determining whether data dependency
2 exists between or among the identified statements prior to switching the order of the identified
3 statements.

1 10. The method of claim 1, wherein identifying the statements comprises identifying
2 statements $\langle t, b_1 \rangle$ through $\langle t, b_m \rangle$, m being greater than 1, where t represents a set of one or
3 more tuples, and b_1 through b_m represent respective modification operations on the set of one or
4 more tuples, and
5 wherein combining the identified statements comprises combining the identified
6 statements into statement $\langle t, c \rangle$, where c represents an aggregation of b_1 through b_m .

1 11. The method of claim 10, wherein combining the identified statements comprises
2 combining the identified statements into statement $\langle t, c \rangle$, where c represents an addition of b_1
3 through b_m .

1 12. The method of claim 10, wherein combining the identified statements comprises
2 combining the identified statements into statement $\langle t, c \rangle$, where c represents a multiplication of
3 b_1 through b_m .

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

1 14. An article comprising at least one storage medium containing instructions that
2 when executed cause a controller to:

3 identify statements in a first transaction that specify modification operations on
4 values b_1 through b_m , m greater than 1, that are commutative and associative, each of the
5 modification operations applied on a set of one or more tuples;

6 combine the identified statements into one statement that specifies a modification
7 operation on a value c that is an aggregation of b_1 through b_m , the aggregation being one of
8 addition and multiplication; and

9 submit the one statement to a database system.

1 15. The article of claim 14, wherein combining the identified statements comprises
2 combining Structured Query Language (SQL) statements.

1 16. The article of claim 14, wherein combining the identified statements is performed
2 prior to submitting the one statement to the database system.

1 17. The article of claim 14, wherein the instructions when executed cause the
2 controller to further group plural transactions into the first transaction.

1 18. The article of claim 17, wherein the controller is separate from a database engine
2 of the database system.

1 19. The article of claim 18, wherein the identifying, combining, and submitting are
2 performed by the controller without first accessing data in relational tables stored in the database
3 system.

1 20. The article of claim 14, wherein the instructions when executed cause the
2 controller to switch an order of statements in the first transaction to place the identified
3 statements adjacent to each other.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

1 22. A system comprising:
2 an interface to receive first queries from a client system;
3 one or more processors; and
4 a software utility executable on the one or more processors to:
5 establish plural sessions with a database system, each session associated
6 with at least one transaction;
7 identify transactions that operate on the same set of one or more tuples;
8 re-allocate transactions between or among the sessions such that the
9 identified transactions that operate on the same set of one or more tuples is allocated to one of
10 the sessions;
11 identify first queries of a particular one of the transactions that specify
12 commutative and associative operations, and
13 group the identified first queries into a second query.

1 23. The system of claim 22, wherein the statements comprises Structured Query
2 Language (SQL) statements.

1 24. The system of claim 22, wherein the controller is adapted to send the second
2 query to a database engine of the database system.

1 25. The system of claim 24, wherein the controller is adapted to group the identified
2 first queries prior to submitting the second query to the database engine.

1 26. The system of claim 22, wherein the software utility is executable to group plural
2 transactions into the particular transaction.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

1 28. The system of claim 22, wherein the identified first queries comprise statements
2 <t, b₁> through <t, b_m>, m being greater than 1, where t represents a set of one or more tuples,
3 and b₁ through b_m represent respective modification operations on the set of one or more tuples,
4 and
5 wherein the second query comprises statement <t, c>, where c represents an
6 aggregation of b₁ through b_m.

1 29. The system of claim 28, wherein c represents an addition of b₁ through b_m.

1 30. The system of claim 28, wherein c represents a multiplication of b₁ through b_m.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

EVIDENCE APPENDIX

None.

Appln. Serial No. 10/694,564
Appeal Brief Under 37 C.F.R. § 41.37

RELATED PROCEEDINGS APPENDIX

None.